TO: Distribution

FROM: Joan Archer

DATE: 28 April 75

RE: Multics Change Requests

Enclosed are copies of Multics Change Requests which
were approved from 1 April 75 to 15 April 75.

Multics Change Request		MCR	1097
		Page	1 of 1

TITLE: Fix bugs in 25-3 with respect to variable
size lots

AUTHOR: Webber, S.

STATUS	DATE
Written	03/25/75
Status	A 04/01/76
Expires	10/01/76

-Coded in: [X] PL/I [X] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR ___
-Fixes Bug Number(s) Unreported
-Documented in MTB ___
-User/Operations-visible
Interface change? [ ] yes [x] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
[ ] Worse
-Replaces MCR ___

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason) No change needed	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY OF PROPOSAL:

Fix bugs in lot_maintainer and fs_search introduced
in 25-3 having to do with variable size linkage
offset tables.

REASONS AND JUSTIFICATION:

The program lot_maintainer was using an obsolete
linkage section header.

The program fs_search was not remapping an error
code properly.

NOTE: Installed in 25-3 on emergency basis.

Multics Change Request

MCR____1098____

Page_____of____

TITLE: Shorten int_entry and int_entry_desc sequences in pll_operators_

AUTHOR: R. A. Barnes

STATUS	DATE
Written	03/24/75
Status	P 64/61/75 A 4/08/75
Expires	10/08/75

-Coded in: ☐PL/I ☒AIM ☐other-explain in DETAILED PROPOSAL

-Planned for System MR _____

-Fixes Bug Number(s)_____

-Documented in MTB____176____

-User/Operations-visible Interface change? ☐yes ☒no

-Incompatible change? ☐yes ☒no

-Performance: ☒Better ☐Same ☐Worse

-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
X	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	No user visible change

Objections/Comments: Test with Answering Service, Message Segments. Timer Manager, etc

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Remove one instruction from the int_entry and int_entry_desc sequence in pll_operators_.

REASONS:

Speed up non-quick internal procedure calls.

IMPLICATIONS:

Programs that violate PL/I rules by fashioning an entry variable out of the address of an internal entry or procedure plus a null display pointer will cause a fault in pll_operators_. These programs were always in error.

DETAILED PROPOSAL:

See   MTB 176

Multics Change Request

TITLE:	Install initialize_builtin	STATUS	DATE

AUTHOR: R. Schoeman

		STATUS	DATE
		Written	03/26/75
		Status	Dom/01/75
		Expires	10/01/75

-Coded in ☒PL/I ☐AIM ☐other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same
 ☐ Worse
-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
X	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #) 54	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Install initialize_builtin, a tool which is necessary
to create the PL/I compiler.

REASONS:

Honeywell has a contract which specifies that the
system must be complete, i.e. able to reproduce itself.
initialize_builtin's ommission from the tools library
meant that the PL/I compiler could not be recreated
without the experimental library.

DETAILED PROPOSAL:

initialize_builtin is used to initialize pl1_data,
a data segment that is a component of the semantic
translator used in processing builtins.

Name: initialize_builtin

The execution of this program initializes an array of n structures in pll_data, where n is the number of names by which builtin functions are known. Each structure contains information on how the builtin function referenced by that name is to be handled by the compiler.

Usage: initialize_builtin

To initialize the builtin_name array in pll_data the following steps are performed:

1) extract the source program pll_data.alm.

2) assemble pll_data.alm in the working directory in which initialize_builtin is to be executed.

3) execute initialize_builtin.

4) replace the newly-created pll_data object segment in its archive.

Page 2 of 2

Multics Change Request

TITLE: Bug fixes to tape_.

AUTHOR: Bill Silver

STATUS	DATE
Written	03 /26/75
Status	A 04/01/75
Expires	10/01/75

-Coded in [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR
-Fixes Bug Number(s) none
-Documented in MTB
-User/Operations-visible
 Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [X] Better [ ] Same
 [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	none

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Fix bugs in tape_. A bug in tape_labeler_
causes the "rewind" order command to function
incorrectly. A bug in tape_write_ causes
data moves to be done with a CSL instruction
rather than the faster MLR instruction.

IMPLICATIONS:

Reading a tape after issuing a "rewind" order
command will now be performed correctly. All
tape writing via tape_ will be more efficient.

DETAILED PROPOSAL:

Change tape_labeler_ to reset error information
whenever it initializes its data bases. Change
tape_write_ to use an aligned rather than an
unaligned based array for moving data.

TITLE: Check for out_of_service privilege in find_

AUTHOR: A. Kobziar

STATUS	DATE
Written	03/20/75
Status	04/01/75
Expires	10/01/75

-Coded in [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) unreported
-Documented in MTB _____
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR _____

Category (Check One)

	Category
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	Invisible change

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

If a known directory has been deactivated, find_ checks whether it is security out_of_service, but does not check if out_service privilege is on. Change find_ to make this check when deciding to return an error code.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1102

TITLE: Convert tool 'nothing' to Version 2 PL/I	STATUS	DATE
	Written	03/24/75
AUTHOR: Paul Green	Status	04/01/75
	Expires	09/24/75

Planned for System: not applicable	
Fixes Bug Number(s): not applicable	CATEGORY (check one)
Documented in MTB: not applicable	( )Lib. Maint. Tools
Incompatible Change: no	( )Sys. Anal. Tools
User/Operations-visible Interface Change: no	(■)Sys. Prog. Tools
Coded in: (■)PL/I ( )ALM ( )other-see below	( )355
Performance: (■)better ( )same ( )worse	( )BOS
	( )Salvager
DOCUMENTATION CHANGES (specify one or more)	( )Ring Zero
MPM (vol,sect) MPAM (sect)	( )Ring One
MOSN (sect) MSAM (sect)	( )SysDaemon/Admin
PLMs (AN#) AN51	( )Runtime
Info Segs	( )User Command/Subr
Other	

OBJECTIONS/COMMENTS:

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:
     Convert nothing.pl1 to Version 2 PL/I.

REASON:
     Version 1 PL/I programs can no longer be traced. "nothing" is a useful
sink for calls, and tracing it can catch such calls.

IMPLICATIONS:
     nothing will be useful again.

DETAILED PROPOSAL:
     No source changes; recompilation only.

Multics Change Request

TITLE: Install an assign_ that sets the support bit
AUTHOR: R. A. Barnes

STATUS	DATE
Written	03/25/75
Status	A 04/01/75
Expires	10/01/75

-Coded in: ☐ PL/I ☒ ALM ☐ other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same
 ☐ Worse
-Replaces MCR _____

Category (Check One)

	Lib. Maint. Tools	
	Sys. Anal. Tools	
	Sys. Prog. Tools	
	355	
	BOS	
	Salvager	
	Ring Zero	
	Ring One	
	SysDaemon/Admin.	
X	Runtime	
	User Cmmd/Subr.	

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason) No user visible change	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

assign_ should set the support bit in its stack frame.

REASONS:

assign_ is a support routine called by such programs as pl1,
plio2_, debug, etc., to do conversions when the characteristics
of source and target are not known until runtime. assign_ calls
any_to_any_ to actually do the conversion. If a condition is
signalled, we would want the default handler not to say that
the condition occurred in assign_, but rather in its most
recent non-support ancestor.

Multics Change Request

TITLE: Speed up iox_$propagate

AUTHOR: Steve Herbst

	STATUS	DATE
	Written	03/25/75
	Status	A 04/01/75
	Expires	10/01/75

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [X] Better [ ] Same
  [ ] Worse
-Replaces MCR _____

Category (Check One)
Lib. Maint. Tools
Sys. Anal. Tools
Sys. Prog. Tools
355
BOS
Salvager
Ring Zero
Ring One
SysDaemon/Admin.
Runtime
User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN57
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Change propagate to call itself recursively only
when there is more than one level of synonyms.

REASONS:

Currently, a recursive call is made for every
IOCB, including one for the IOCB on which pro-
pagate was called. The proposed change saves
one recursive call in every case and one for
each first level synonym.

TITLE: Implement iox_$move_attach	STATUS	DATE
AUTHOR: S. Herbst	Written	03/25/75

-Coded in: [X] PL/I [ ] AIM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB ___061___
-User/Operations-visible
 Interface change? [X] yes [ ] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
 [ ] Worse
-Replaces MCR _____

Category (Check One)		Status	A 04/01/75
	Lib. Maint. Tools	Expires	10/01/75
	Sys. Anal. Tools		
	Sys. Prog. Tools	DOCUMENTATION CHANGES	
	355		
	BOS	Document	Specify One or More
	Salvager	MPM (Vol, Sect.) subroutines	
	Ring Zero	PLMS (AN #)	
	Ring One		
	SysDaemon/Admin.	MOSN (Sect.)	
	Runtime	MPAM (Sect.)	
X	User Cmmd/Subr.	MSAM (Sect.)	
		Info Segs	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

   Implement the new iox_$move_attach as described
   in MTB-061.

REASONS:

   There is a need to be able to transfer an attach-
   ment from one IOCB to another without calling the
   dim's detach entry.

DETAILED PROPOSAL:

   Add the module move_attach to the I/O system and
   add the entry to iox_.

DOCUMENTATION: See attached page.

Name: iox_$move_attach

This entry moves an attachment from one I/O switch,
s1, to another I/O switch, s2.   The switch s2 must
be in the detached state when the entry is called.
If it is not, the code error_table_$not_detached
is returned and no change is made to s1 or s2.   If
s1 is in the detached state, the code error_table_
$not_attached is returned and no change is made to
s1 or s2.

Moving the attachment moves the attach description
and open description of s1 to s2.   All pointer val-
ues and entry values are copied from the control
block of s1 to the control block of s2.   (These
values are listed in the Subsystem Writer's
Guide Section, the I/O Control Block). Attach and
open data blocks maintained by the I/O Module (if
s1 is attached) are not affected. Finally, s1 is
set to the detached state and iox_$propagate is
called for both s1 and s2.

Usage:

declare iox_$move_attach entry (ptr,ptr,fixed(35));
call iox_$move_attach (iocb_ptr_1,iocb_ptr_2,code);

    1.   iocb_ptr_1   points to the control block
          (Input)   for s1
    2.   iocb_ptr_2   points to the control block
          (Input)   for s2
    3.   code   is a system status code
          (Output)

Multics Change Request

TITLE:	Install New Graphic System	STATUS	DATE
AUTHOR:	Bob May (PHX) for Chris Tavares (FSO)	Written	02/12/75

	Category (Check One)	STATUS	DATE
		Status	A 04/01/75
		Expires	08/12/75

-Coded in: [X] PL/I [X] ALM [X] other-
 explain in DETAILED PROPOSAL
-Planned for System MR 2.1
-Fixes Bug Number(s) na
-Documented in MTB 137
-User/Operations-visible
 Interface change? [X] yes [ ] no
-Incompatible change? [X] yes [ ] no
-Performance: [X] Better [ ] Same
 [ ] Worse
-Replaces MCR _____

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.) GUS/Rev.4	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments: A plan for reviewing and
publishing the updated GUS and for auditing
code is needed

Info Segs graphics(_changes).info
Other (Name)
None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: The new Multics Graphic System replaces an existing, but
unsupported, version in >sss. It provides full functionality
for a variety of terminals including the ARDS, IMLAC, CalComp
and Tektronix devices. An initial release was required for MR 2.0.

DETAILED
 PROPOSAL: The Release 2.1 (IQ75) is intended to do the following:

. Delete the obsoleted software from >sss. This includes the following:
 a) bound_graphics_
 b) bound_lsm_
 c) gr_print (in bound_debug_). Convert the obsoleted call from
    gr_print to gr_print_ in unbundled.

. Clean up the include files and several minor bug fixes.

. Add a new source language compiler, compile_gdt, to the system.
 This command is used to compile binary tables for driving the
 various graphic devices. Source for this must be suffixed
 with ".gdt". compile_gdt translates the source to ALM and
 then automatically calls the assembler.

IMPLICATIONS: No users currently keep graphic databases in the old format.
 Those users who have segments of old Multics Graphics Code
 (graphics "printfiles") must convert these segments to the
 new format. The command, tmgc, will do this for them. The
 subroutines, gui_ and plot_ are replaced with incompatible
 interfaces. Conversion to the new interface is necessary but
 minor. A survey taken at MIT produced very little objection to
 the changes.

TITLE: Resolve the message segment "uncertainty principle"

AUTHOR: Jerry A. Stern

	STATUS	DATE
Written		3/24/75
Status	A	04/01/75
Expires		10/01/76

-Coded in: ☑PL/I ☐ALM ☐other- explain in DETAILED PROPOSAL

-Planned for System MR **3.0**

-Fixes Bug Number(s)_____

-Documented in MTB_____

-User/Operations-visible Interface change? ☐ yes ☑ no

-Incompatible change? ☐ yes ☑ no

-Performance: ☐ Better ☑ Same ☐ Worse

-Replaces MCR_____

Category (Check One)

Category	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Calvager	
Ring Zero	
Ring One	✔
SysDaemon/Admin.	
Runtime	
User Cmmd/Subr.	

DOCUMENTATION CHANGES

Document	Specify One or More
MFM (Vol, Sect.)	
PLMS (AN #)	**AN69**
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: It is currently impossible to guarantee that a given process will succeed in reading through a list of messages in a given message segment if some other process is able to delete messages from that same message segment. It is proposed that this deficiency be corrected.

Reasons: If a message is deleted from one of the IO daemon queues at a critical moment, the IO coordinator can be misled to believe that there are no more requests in that queue to be processed. This situation lasts only temporarily, however. The IO coordinator will begin again reading messages from the head of the queue, thereby possibly repeating a small number of requests. Soon, however, when the changes to the IO daemon currently in progress have been installed, this problem will become more severe. A much larger number of requests may be repeated due to the fact that requests of different access classes may, at times, be placed on a "waiting" list and hence remain in the queues.   .

   The problem described above is really a general problem. It therefo most likely affects the absentee facility as well as any other subsystem which attempts to use message segments as a queueing mechanism.

Implications: Use of message segments will be more consistent and deterministic.

Detailed Proposal: The method of "incremental" message reading
        supported by the message segment facility depends on the
        existence of the last read message in order to find the
        next message to be read.   The caller of the message segment
        facility supplies the message ID of the previously read
        message.   If this message has been deleted, an error code is
        returned which is the same as that returned when the end
        of the message list is reached.   Hence, the caller cannot
        distinguish between reading the end of the list or having
        a single message deleted out from under him!

        To correct this problem, advantage will be taken of the fact
        that a message ID is simply a clock time and that the message
        list is kept in chronological order.   If a call is made to
        read the next message after message X, an attempt will be
        made to locate message X as usual.   If message X does not exist,
        then the message list will be searched from the beginning
        until a message with an ID greater than X is found.   (A
        similar approach will be taken for backward incremental reading.)

Multics Change Request

TITLE: Modifications to net_connect_

AUTHOR: Kenneth T. Pogran

STATUS	DATE
Written	3/31/75
Status	A 04/08/75
Expires	10/08/75

DOCUMENTATION CHANGES

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? [X] yes [ ] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
 [ ] Worse
-Replaces MCR _____

Category (Check One)

	Category		Document	Specify One or More
	Lib. Maint. Tools			
	Sys. Anal. Tools		MPM (Vol, Sect.)	
	Sys. Prog. Tools		PLMS (AN #) 74	
	355			
	BOS		MOSN (Sect.)	
	Salvager			
	Ring Zero		MPAM (Sect.)	
	Ring One			
	SysDaemon/Admin.			
	Runtime		MSAM (Sect.)	
	User Cmnd/Subr.			
X	Network			

Objections/Comments:

Info Segs
Other (Name) NUS 6.3.2
None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY: The following changes are made to net_connect_: .

1. A tracing facility is added to net_connect_. Calling the entry point
    net_connect_$tracing_on enables tracing in the user's process; calling
    net_connect_$tracing_off disables tracing. The default is off.

2. net_connect_ returns to the user the proper error code
    (error_table_$ncp_error) for sockets placed into the "Broken" (13) state
    by the NCP due to an NCP Software Error.

3. Entry points are added to net_connect_ for the establishment of
    "privileged" connections -- connections from sockets whose 24-bit "User ID"
    (see NUS 6.2.1) is other than that of the calling process. Use of
    these entries is restricted to those users with access to netp_.

4. Three new connection modes are added, corresponding to the present "ICP",
    "Connect", and "Listen" modes, for which the record of the connection
    attempt is not automatically deleted by net_connect_ in the event the
    connection attempt is unsuccessful. Instead, the user must call
    net_connect_$conclude_connection (or net_connect_$conclude_priv_connection,
    as appropriate) to determine the outcome of the connection attempt.
    Operation of net_connect_ with the present connection modes is not
    changed.

5. Calls to ipc_$decl_ev_wait_chn are replaced with calls to
    ipc_$delete_ev_chn where appropriate.

6. The internal structure of net_connect_ is improved.

REASONS: "The net_connect_ module provides a convenient means for a user to establish
    a connection to a socket or pair of sockets at any Network host."
                                          -- NUS, Sect. 6.3.2

1. Occasionally the connection process goes astray, with one of the
    sockets ending up in an unanticipated state. This can lead to
    net_connect_ returning to the user the code error_table_$net_icp_bad_state

"Initial connection socket is in an improper state." When this error occurs consistently when a user attempts a particular network connection, it is an indication that something is wrong: for example, the foreign host is not performing the Initial Connection Protocol properly. The tracing feature of net_connect_, when enabled, will print a message at each stage of the connection process, informing the user of the actual states of the sockets involved. With this information it is usually possible to determine what has gone wrong in the connection process.

2. net_connect_ did not previously handle the transition of a socket into the "Broken" state correctly. It returned error_table_$net_icp_bad_state, implying that something had gone wrong with the connection attempt, rather than with the socket itself.

3. Upcoming uses of net_connect_ in Server process applications, such as Jerry Rudisin's experimental RSEXEC Server and, in particular, the redesigned, more modular logger_ for the Answering Service process, require this capability.

4. Presently, a status code indicating the outcome of the connection attempt is passed as the event message of the IPC wakeup sent by net_connect_. Designers of Server applications using net_connect_ (especially logger_, noted in (3) above) would prefer not to rely on the integrity of the event message, instead using the wakeup as an indication that net_connect_$conclude_connection should be called to determine the outcome of the connection attempt.

5. When net_connect_ was originally implemented, there were bugs in both ipc_ and in the NCP which together resulted in faults in the user's process when net_connect_ deleted event channels at what should have been perfectly legitimate but, due to the bugs, unfortuitous moments. The interim solution was to never delete event channels, but to turn them into event wait channels which were never "waited" upon. As both bugs have now been fixed, net_connect_ can be changed to once more do the "right" thing.

6. As more features were introduced, the need for better internal structure in net_connect_ became apparent.

DETAILED PROPOSAL:

1. After checking the state of all three sockets upon receiving a socket-state-change event call wakeup, net_connect_ will print a message (if tracing is enabled) of the form:

        net_connect_: Trace U=n, S=s,t,u

    where n is the pin number of the ICP socket, and s, t, and u are the states of the ICP pin, read, and write sockets, respectively.

3. The following entry points are added:

        net_connect_$initiate_priv_connection
        net_connect_$conclude_priv_connection
        net_connect_$abort_priv_connection

    Use of these entries is restricted to those users with access to the gate netp_, as netp_$ncp_priv_activate is used to activate the relevant sockets.

(END)

Multics Change Request

JWG

TITLE: New modes and orders for MCS tty_dim

AUTHOR: Michael J. Grady

STATUS	DATE
Written	4/3/75
Status	A 04/08/75
Expires	10/08/75

-Coded in: [X]PL/I [ ]ALM [ ]other-
 explain in DETAILED PROPOSAL
-Planned for System MR 3.0
-Fixes Bug Number(s)_____
-Documented in MTB _____
-User/Operations-visible
 Interface change? [X] yes [ ] no
-Incompatible change?[X] yes [ ] no
-Performance: [ ] Better [X] Same
 [ ] Worse
-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	Subroutines
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	pending changes
Other (Name)	
None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Several new modes and orders have been designed with MCS. These
represent changes in the handling of some old modes, removal of
others, and the addition of several new modes and orders. Also
the removal of the special printer on and printer off characters
(\006 and \025) is proposed.

REASONS:

These new features and capabilities are supported by MCS and
should be available to users. Also, since many of these changes
have been suggested for a long time, now seems like a good time
to implement them.

IMPLICATIONS:

Certain user and system programs will have to be modified as a
result of dropping \006 and \025, however order calls are
availiable now to eliminate the need for these special
characters.

DETAILED PROPOSAL:

1) The mode "hndlquit" has been improved. Besides not doing an
   automatic reset-read, it no longer does an automatic
   reset-write, giving the user complete control of his terminal
   when the QUIT button is hit.

2) Remove "writew" mode. This is the write wait mode and was
   designed for the on-line T&D group so that a T&D program would
   know how much data had been written to the terminal when the
   QUIT button was pressed, so that it could retype any lost
   output. It does not work now and is not used. The new
   "hndlquit" mode is better suited to this purpose.

3) Several new orders were invented to enable the answering
   service to read answer backs and change terminal types
   appropriately. These new orders are:

   a) wru   initiate the reading of answer backs; may
                   only be issued by the hproc for the line,
                   i.e., the answering service.

   b) store_id   save the answer back id for later use by the
                   user process.

   c) set_type   change the terminal type of the line. This
                   affects only the type of translation and the
                   new-line delay timings used.

4) Drop the special meaning of \006 and \025. These characters
   are currently used by some programs to turn on and off the
   printer of a particular terminal, however these are
   nonstandard definitions of these characters and with the
   addition of echoplex, these characters are not sufficient to
   control the action of the keyboard-printer connections at the
   users terminal. Two orders "printer_on" and "printer_off" have
   existed for a long time and were intended to replace the use
   of \006 and \025. The removal of support for these nonstandard
   characters will force the issue. Note that the ARPA Net
   software for Multics does not recognize any special
   significance of these characters and this has not caused any
   special hardships.

5) Add a new mode "vertsp"; if on it indicates that the terminal
   is capable of vertical spacing actions, i.e., form feed and
   vertical tab, and these characters will be sent to the
   terminal. Otherwise they will be escaped.

This file contains version 2 PL/I BUGS, PLANNED IMPROVEMENTS,
PLANNED LANGUAGE FEATURES, UNDIAGNOSED PROBLEMS, and FURTHER INFORMATION.

BUGS marked with * have been fixed in the experimental compiler located in >ldd>
E S without * will, in general, exist in both the installed compiler and the
experimental compiler.

1337 next free number
1336 75.03.27 eew based_char1 = translate(auto_char1,const1,const2); sometimes
                  gets FATAL ERROR 310. (isn 7038).
1335*75.03.24 rhs abs(unaligned) fails inside an expression because an
                  unaligned temporary is used.
1334*75.03.19 rhs call foo(arith_array), where foo is declared with
                  a char(*)_varying input parameter, fails. Target string gets
                  wrong length.
1333*75.03.18 rab char30_varying = fixed_dec31; fails. Whole string temp not
                  copied.
1332*75.03.15 rhs call foo((i)); where i is fixed bin and foo expects (*) fixed
                  gets FATAL ERROR 336 with table option. Compiler also mishand
                  promotion of i to (*,*) fixed bin.
1331*75.03.14 rhs if one member of a structure is passed as arg, and the structu
                  is set in an aggregate assignment stmt after that, and the str
                  auto or static, another member of the structure may get an err
                  WARNING 307 under rare circumstances.
1330*75.03.10 rhs dcl ptr builtin; call pointer(...); is not diagnosed
                  (isn 7036).
1329*75.03.10 eew compiler should diagnose attempts to initialize static ptrs
                  to other than null or null() (mprf 8098).
1328*75.03.07 eew char8_aligned = substr(varying,4,1); may fail due to lack
                  of necessary masking.
1 7*75.03.06 eew dcl a(2) fixed bin int static init(1,2,3); does not get ERROR
                  (c80674).
1326*75.03.05 dsl atan(1,0) fails sometimes, returning negative of correct
                  value. (mprf 7768)
1325*74.02.14 eew complex_flt_bin = real_scaled_fixbin; fails.
1324*75.02.13 rhs in the general case of an error raised in record-directed
                  i/o the error, not transmit, condition is raised.
1323*75.01.10 rhs allocate stmt of struc with refer extents followed by 2 uses
                  of hbound on contained array with refer extents can get
                  ERROR 313.
1322*75.02.03 rab index(substr(s,i),"1"b) where i has precision > 18 may fail.
1321*75.02.03 rhs bit,char,copy,high,low,dim,hbound,lbound.addrel,baseno,baseptr
                  convert,lineno,offset,pageno,ptr,rel,stac,valid builtins req
                  scalar arguments but no check is made.
1320*75.01.31 rhs add, subtract, multiply, divide, fixed, binary, float, decimal
                  bit, character, and precision builtins do not check for
                  negative constant lengths or precisions.
1319*75.01.30 eew char6_aligned = char32_aligned; can fail.
1318*75.01.24 rab dcl str auto char(length(char_star_fun(length(b)))); fails due
                  to pl1_operators_ bug.
1317*75.01.24 eew (stringsize): bit2= fixbin; where fixbin has a large
                  value, does not raise stringsize condition. Bug
                  in assign_op.
1316*75.01.24 rhs bit(<expr>,<non_integer>) gives the wrong result.
1315*74.01.23 rab var_ch_arr,ch_arr = char(var_bit_arr) produces code that fails
  4*75.01.22 rab storage condition raised in var_char_array,char_array=var_char
                  caused by bad addressing for varying aggregate temporaries.
1313 75.01.21 mbw size condition not raised in decimal assignment when value too
                  large.
1312*75.01.21 rhs fixdec3 ** 2 gets wrong precision.

1311*75.01.20 rab aggregate_fun <or> aggregate_fun, where both fun's are the
             same,fails.
1310*75.01.20 rab bit_varying = x; where x is fixed bin with a scale greater
             than its precision, fails in that bit_varying is given a
             negative length.
1309 75.01.15 rab get data fails for any based variable whose implicit
             qualifier is other than a simple reference to a scalar pointer
             variable (c53184). No room in runtime_symbol node to
             encode a more complicated qualifier expression.
1308*75.01.14 rab dcl a(10) init((5)(1,*)); gets FATAL ERROR 310.
1307*75.01.13 rab x(a) = y(b) ** a; can fail due to bad addressing code.
1306*75.01.13 rhs math builtins with decimal args should produce decimal results
             of the same precision.
1305*75.01.13 rab abs(4), complex(16,8), etc. should produce decimal results.
1304*75.01.13 rhs get edit may fail with drifting sign picture format.
1303*75.01.10 rab "0"b > "1"b fails.
1302*75.01.10 rab translate("a","ABCD","aaaa") gets "D" instead of "A".
1301 75.01.09 rab (any_to_any_ bug): ".000000000e0b" gets underflow while
             being converted to float binary.
1300*75.01.08 rab bad relocation bits for internal file constants.
1299 75.01.08 rab symbol table entry built incorrectly for var with position
             attribute.
1298*75.01.08 rhs tan(complex_var) fails.
1297 75.01.07 rab (any_to_any_): flt_dec3 = "8.23e-127"; gets conversion instead
             of underflow.
1296*75.01.07 rhs onfile() not consistent about length of file name.
1293*75.01.06 rab passing substr(str,1,<expr>) as arg in a procedure with a large
             stack frame may fail.
1292*75.01.06 rab call char_star(before(char_varying,"$")); gets ERROR 313.
             (builtin bug).
1291*75.01.06 rab real_decimal + complex_decimal fails.
1290*75.01.06 rab allocate stmt or allocation builtin get fault at runtime
             for internal controlled variable that is NOT set.
1289*75.01.06 rhs allocn not recognized as another name for allocation builtin.
1288*75.01.06 rhs dcl f file ext constant; gets ERROR 218.
1287*75.01.06 rab string(valid(pic)) gets ERRORs 313 & 316 (builtin bug).
1286*75.01.03 rab a(j) = b + c(j); where a and b are fixed dec(7,3) and c
             is fixed bin fails (isn 3419).
1285*75.01.03 rhs put list(array_fun()); puts only 1 element of array_fun()
             (mprf 7945).
1284*75.01.03 rhs call f(array); where f expects an array of different
             dimensionality than array does not get ERROR 79 as expected.
             (mprf 7940).
1283*75.01.03 rab put data(structure_star_extents_parameter); can fail.
             (mprf 7929)
1282*74.12.30 rab put data(packed_star_array) and put list(packed_picture_array)
             can fail.
1281*74.12.29 rab assignment of array cross section members of structures may fail
             (bug in expression_semantics)
1280*74.12.27 rhs put list(convert(s,2.000e0+(2+3i)));gets ERROR 253.
1279*74.12.26 rab (optimizer bug): a=array(i+j);begin;j=j+1;end;b=array(i+j);
             fails because optimizer fails to realize that stmts in begin bl
             set inputs to expressions it has commoned.
1278*74.12.26 rab string(defined_structure) gets FATAL ERROR 310 (mprf 7909).
1277*74.12.21 rab assignment of aggregate on character (non_word) boundary so i
             See test case. (c80657.)
 276*74.12.20 rhs call defined_entry_variable; gets FATAL ERROR 310.
 275*74.12.19 rab call ioa_(char(<constant>)); fails; bug in builtin.
 274*74.12.13 rab d = 6/2; gets IPR fault if d is decimal number whose scale
             factor is larger than 32 or smaller than -31.

273*74.12.18 rab conversion of fixed decimal to fixed binary by
                  type instead of to target can fail if source scale
                  is outside range of -38 to +38.
272*74.12.18 rab do i = 1 to 6/2; where i is fixed bin gets IFR fault.
271*74.12.17 rab passing an aggregate expr of unaligned short strings or arithmet
                  can get ERROR 312.
270*74.12.12 rab dcl a bit(<const>) int static init(<char_string_constant>);
                  drops the last character of char_string_constant in
                  initializing a.
269*74.12.11 rhs (low priority) assignment of aggregates with refer extents
                  does not quite work properly in that bounds checking should
                  take place before any assignment. If checking is successful,
                  a simple copy can be done.
268*74.12.05 gdc p -> data(i,*) = q -> data(i,*); can fail when data has refer
                  extents. (mprf 7865). Bug in expand_assign.
267*74.12.03 rab substr(picture_in_struc,...) fails. builtin bug.
266*74.12.03 rab repeated use of substr(p(i)->varying,n) can cause FATAL ERROR
                  337 with optimize. bug in builtin.
265*74.12.02 rab some operations with ""b still fail.
264*74.11.27 rab atan(dy,x) fails when dy is double precision and x is single.
                  See test1263.
263*74.11.27 gdc For atan(y,x) where y and x are float binary, the result
                  precision should be the maximum of the precisions of y and x
                  instead of the precision of y.
262*74.11.25 rab dcl ... a(10b) ... ; can get FATAL ERROR 336 with table option.
261*74.11.25 rab float_unal ** float_unal can fail. (save_value bug.)
260*74.11.25 rhs structure-valued function calls fail. (declare bug) (c52055).
259*74.11.21 rhs dcl str auto char(length(char_star_fun(length(b)))); where
                  b has star_extents gets FATAL ERROR 335. (mprf 7837)
258*74.11.18 rab substr(bit(<expr>,72),37) fails. Similar constructs also fail.
257 '4.11.18 rab repeated use of dim and lbound bifs with arrays of star
                  extents and optimize options can cause ERROR 313 (c80654)
                  (prepare_operand bug).
256*74.11.17 rab imag(flt_cmpx_bin(i)) fails -- bug in builtin.
255*74.11.17 rab unaligned member of auto structure passed incorrectly to quick
                  proc if passed by ITP.
254*74.11.12 rab (pl1_operators_ bug): return(char(*)) from inside a non-quick
                  begin_block faults in pl1_operators_ (mprf 7815).
253*74.11.12 rns when a structure is erroneously declared without a level 1
                  component, the compiler faults after correctly printing
                  out ERROR 16. (mprf 7812).
252*74.11.10 rab In rare circumstances, the use of an unaligned short bit string
                  parameter in the statement immediately after it is set can cause
                  ERROR 313 with optimize.
251*74.11.06 rab In a multiple-entry proc with some params in different
                  positions and a prologue, an incorrect entry sequence can be
                  generated in raare circumstances.
250*74.11.06 rhs while clause of do statement containing an irreducible
                  varying or star extents function reference is compiled
                  incorrectly.
249*74.11.05 gdc if an array of substructures has refer extents for more than
                  one bound, redundant assignment statements will be generated at
                  allocate time to set up the based bounds. Also,
                  simplify_expression should be run on the word size of the struct
                  if it is non-constant.
248*74.11.05 gdc aggregate statements involving members of arrays of
                  structures with expression extents may fail if program
                  has put data, get data statements or is compiled with table.
247*74.11.05 rab use of nested initial-lists in initial attribute can cause
                  compiler to loop. Bug in compile_tree for nested join ops.

1246*74.11.01 gdc dcl str auto char(length(func(b))); where func returns char(*)
                   may get FATAL   n 335. (mprf 7786).
1245*74.11.01 rab enable_f   operator sets spl5 to incorrect value.
1244*74.10.26 rab opti zer bug: substr(str,f(str)) = <expr>; substr(str,f(s*r))
                   = <expr>; fails where f(str) is any expression with str as   o
                   or argument. Optimizer removes second statement. This is a ra
1243*74.10.21 rab dcl 1 st based,2 at,3 array(m) float bin(63),3 x fixed bin,
                   2 bt,3 (y,z) fixed bin,3 dble float bin(63); - y and dble
                   get placed on odd rather than correct even bound. (mprf 7774)
                   Bypass: at which requires doubleword alignment, should be
                   padded to doubleword bound since bt requires double align.
                   (Bug in get_size and glitch in offset_adder.)
1242*74.10.19 rab Use of more than 1 short strings string_overlay defined
                   on a short string member of a structure can cause bad code in v
                   circumstances if optimizer used. (Not an optimizer bug. Cause
                   to bug 941.)
1241*74.10.19 rab varying_str_const(constant) passed by value to entry with
                   char(*) or options(variable) causes ERROR 315.
1240*74.10.14 rab execution of a complex binary comparison can cause zerodivide
                   condition. Bug in code generator.
1239*74.10.07 rab complex float bin operations with constant operands can fail
                   if the real part of a constant is an integer.
1238*74.10.07 rab dcl foo int static init(<expr> + or - <expr>); gets fatal
                   process error instead of ERROR 324.
1237*74.09.24 gdc index(substr(reverse(based_varying_str),i),comma) gets ERROR
                   313 (mprf 7685).
1236*74.09.24 gdc imag(st.foo), where st is auto or static, can cause other
                   refs to foo to be bad. bug in builtin.
1234*74.09.23 rab fixedbin71 ** 1 gets ERROR 302.
1233*74.09.23 gdc fixedbin71 ** 0 fails (gets bad code and ERROR 302)
1232*74.09.23 rab calls with more than 64 args cause ERROR 310. Should get
                   implementation restriction message.
1231*74.09.16 gdc hbound(array,var) gets fault or fatal process error at runtime
                   (mprf 7662).
1228*74.09.09 eew substr(s,1,0) = ""; may fail in that the rest of s may be
                   changed. Note that this does not fail when third arg is
                   variable instead of constant zero.
1227*74.09.09 rab (optimizer bug): if unal_str = ...then if unal_str ^= ...
                   call foo(addr(unal_str)); sometimes fails because the addr of
                   a temp created for unpacked value of unal_str is passed out.
                   (mprf 7642).
1223*74.09.06 rab return(<short_string_expr>) may fail with no optimize & many
                   returns declarations (at entry pts). Remedy: use optimize.
1219*74.08.29 rhs aggregate_fun1() <op> aggregate_fun2() fails -- bad code & ERRO
1217*74.08.26 rab bad code for more than one invocation of the same
                   returns(char_or_bit(*)) function in the same statement.
1212*74.08.19 rhs varying_ch_array, ch_array = char(bit_varying_array); gets
                   ERROR 313 (mprf 7603).
1186 74.07.23 rab dcl c char(<8) auto|static unal;dcl cb char(<8) unal
                   based(addr(c)); references to cb are not padded while
                   references to c are. This is part of a more general
                   problem which has always existed and will not be
                   fixed quickly.
1118 74.05.23 rab any_to_any_: bit to char conversion fails for strings longer t
                   (mprf 7221).
1117*74.05.22 rab get data; fails if input variable is declared but not
                   referenced in the program.
1006 74.01.29 rab into, from options and string, unspec builtins fail for a
                   connected array reference whose declaration doesn't have its
                   own dimensions. This is a rare case. Example:

dcl 1 st(3), 2 a fixed bin; write from(a); Note that st
                    has no other members.

SUGGESTED IMPROVEMENTS
2? 75.01.07 rhs onloc() does not recognize quick procedures.
21 74.08.27 rhs x(i,*) = u(i,*); where x is based produces a temporary of the
                    wrong size, possibly causing FATAL ERROR 308.
110 74.05.16 rhs %include statement on line 2 causes strange listing (mprt 7190).
033 74.02.26 rhs If the 2nd or 3rd argument of translate bif or 2nd argument of s
                    or verity bif is constant, the allocate bit in the symbol node s
                    be turned off so that the constant is only allocated if it is re
                    needed (mprf 6815).
77 73.12.28 rhs string(char_array(i,*)) gets ERROR 272 (mprf 6367).
69 73.12.27 rhs compiler should diagnose use of illegal exprs in init attribute c
                    static vars (mprf 6154).
64 73.12.26 rab dcl mumble fixed bin; a %include statement; where statement has a
                    complete declaration gets misleading error message in that "a" is
                    not printed (mprf 5883).
59 73.12.18 rab LEX: comments and blank lines should be allowed after logical er
46 73.12.05 rab symbol map listing should include file attributes, e.g., input, c
62 73.09.02 rhs dcl A(n,m) float bin based(p),B(n,m) float bin based(q);
                        A(i,*) = B(i,*)
                    generates assignment to temporary when
                        A(*,*) = B(*,*)
                    uses copy words operator directly into A. Furthermore, size
                    of temporary used is wrong! Instead of allocating space for
                    one row (m words), space for entire array (n*m) words is
                    allocated!
87 72.10.06 blw put transfer vectors in listing (mprf 4877)
78 72.10.03 rhs suppress conversion message for refer(struc.bit) when substr prov
8?   2.08.13 rhs (suprg): array = scalar; / can suppress range checking code
28 72.07.10 rhs remove extra, unneeded assignment in subscript exp involving fix
20 72.07.03 blw make two entries in profile for "if ... then ..."
46 72.06.03 pg   print source statement on-line only once and limit number of line
22 72.05.18 acf validate should set error bit if dcl is incomplete or invalid
80 72.05.11 rhs dcl a(101b) static; / misleading error message
77 72.05.11 rhs dcl lv label local static init(...); / no error message
76 72.05.11 rhs improve returning of unaligned items, particularly ptrs
44 73.01.19 rab constant expression involving division or non-integers are
                    not done at compile time
02 72.03.06 rhs name appears on several entry statements / error 213 is confusing
86* 72.01.06 rab x=f(); where f returns(varying)/can be optimized into call

FURTHER INFORMATION

When a problem is discovered, it is given a date and a serial number.
An attempt is made to produce a small test case which exhibits the problem.
The test cases are named testnnn.pl1 (where nnn is the problem serial number)
and are kept in >ldd>exl>s>v2pl1.test.archive on the PCO and MIT systems.
If the short description of an item in this file is not sufficient, the
test case, if it exists, may provide further information. In addition,
the test cases are used (albeit infrequently) to run regression tests on
the compiler.
EN

Multics Change Request

TITLE: Fix reused address bug in Salvager

AUTHOR: A. Kobziar

-Coded in: [X] PL/I [ ] ALM [ ] other-
 explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [X] Better [ ] Same
 [ ] Worse
-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
X	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

STATUS	DATE
Written	04/01/75
Status	A 04/08/75
Expires	10/08/75

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	bug fix

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Salvager tries to handle a reused address in a
256k segment with a 64k page table. This results
in a subsequent crash. Fix the zeroing of reused
addresses by putting only the address of the one
page into a small page table rather than all 256
addresses.

DETAILED PROPOSAL:

Coded, tested, and sent to Phoenix as an emergency
fix.

Multics Change Request

TITLE:	Install compare_mst		STATUS	DATE
AUTHOR: A. Kobziar			Written	04/01/75

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
[ ] Worse
-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
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X	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

STATUS	A 04/08/76
Expires	10/08/75

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	51
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

> Install compare_mst in the Tools library. This command prints a
> summary of differences between two Multics System Tapes. (service,
> salvager, or bos).

REASONS:

> A standard Multics release ships source, object, and a new system
> tape. By generating a new system from this object, and comparing
> it to the released system, one can determine if the correct object
> has been shipped.   Comparing MST tapes also provides an easy
> method for checking for undetected tape errors in the object. For
> development machine users, it provides a method for double checking
> the completeness of a hardcore submission.

> This command should also be useful when one has an MST, but is not
> sure exactly what is on it. By comparing the unknown MST to a known
> MST, all differences will be listed.

DETAILED PROPOSAL:

> See attached draft documentation.

Name: compare_mst

     This command is used to read two MST tapes and to list all
differences between them. All differences in segment headers,
and the starting address of any inequalities or differing lengths
of segment contents are noted. Additions, deletions, and moves
of segments are handled. One can optionally save the contents
of differing segments in the user's working directory for further
detailed comparisons. Any number of collections can be handled,
but a warning message is printed if a tape does not end in a
collection mark.

Usage:

     compare_mst   tape1   tape2   -control_arg

     tape1   is the tape label of the old tape

     tape2   is the tape label of the new tape

     control_arg:

        -save   if any discrepencies in the contents
                         of corresponding segments are noted,
                         the contents will be saved in the user's
                         working directory under the names
                         "tp1.<segment_name>" and
                         "tp2.<segment_name>". An added segment
                         will be saved under the name
                                  "tp2.<segment_name>".

Multics Change Request

R.A.B.

TITLE: New FORTRAN compiler

AUTHOR: David Levin

-Coded in: ☒ PL/I ☐ AIM ☐ other-
 explain in DETAILED PROPOSAL
-Planned for System MR   2.2
-Fixes Bug Number(s) see sheet
-Documented in MTB
-User/Operations-visible
 Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☒ Better ☐ Same
  ☐ Worse
-Replaces MCR

Category (Check One)	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Salvager	
Ring Zero	
Ring One	
SysDaemon/**Admin.**	
Runtime	
User Cmmd/Subr.	
X	Unbundled

STATUS	DATE
Written	03/31/75
Status	A 04/08/75
Expires	10/08/75

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	Documented in MPM

Objections/Comments:

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

1. Fix unreported and reported bugs.
2. Improve data initialization code.
3. Implement new interface with code generator.
4. Make use of improved optimizer and code generator.

REASONS:

1. Initial implementation of data initialization
    required 4 or more external calls per array
    element. New implementation requires none.
2. Code generator was not informed that the optimizer
    was invoked, although that information is useful to
    it.
3. The soon to be installed PL/I compiler generates
    improved code for many constructs.

This file contains fortran BUGS, SUGGESTED IMPROVEMENTS,
PLANNED LANGUAGE FEATURES, UNDIAGNOSED PROBLEMS, and FURTHER INFORMATION.

BUGS marked with * have been fixed in the experimental compiler located in >ldd>e
BUGS without * will generally exist in both the installed compiler and the
experimental compiler.

147 next free number
141*75.03.24 dsl Unformatted I/O (both random and sequential), does not
                 work at all. This is due to an unset variable in the
                 I/O package.
140*75.03.21 dsl If a member of common appears in a namelist group, the
                 common block must be allocated or namelist I/O using
                 that group will fail. This only affects common
                 blocks which are only referenced in namelist groups.
139*75.03.19 dsl Input errors involving namelist and list-directed
                 input will probably result in fatal process errors.
138*75.03.10 rab Incorrect subscript code is generated for arrays whose
                 starting element is more than 64K words from the
                 beginning of a segment. Use of the optimizer may
                 alleviate the problem.
137*75.03.10 rab Optimizer bug for arithmetic if statements. If any
                 target results in a backward transfer, then
                 subsequent targets which are forward transfers will
                 not be optimized.
136*75.03.10 dsl A bug in the code generator prevents debug and probe
                 from obtaining valid runtime addresses for members
                 of FORTRAN common.
135*75.03.10 dsl The two character sequence "\F", where F is uppercase,
                 should be recognized as an end of file indicator.
134*75.02.26 dsl When processing carriage control characters on output,
                 no attention is payed to the hardware
                 restrictions concerning overlapping fields. Very
                 rarely, this results in garbled output. The
                 occurances are infrequent and many times not
                 reproducible.
133 75.02.26 dsl Mode statements of the form:
                        mode*k h_name ...
                 where "h_name" is any name starting with a lower
                 case "h", will not compile correctly. This is due
                 to the compiler interpreting decimal integer
                 followed by "h" as a hollerith constant.

132*75.01.21 dsl If a symbol has both the external and parameter attributes,
                 it is an entry variable not an entry constant. The link
                 should be to the value of the variable. For example-
                        subroutine test(x,y)
                        external x
                        y = x(y)
                 should generate a link to the entry variable x, not the
                 entry constant x.
131*74.12.05 dsl If a character array appears in a call statement, then I/O
                 statements referencing that array name may be compiled
                 incorrectly. Scalar references are not affected.
130*74.12.05 rab Code generator does not handle arithmetic if statement
                 when the three target labels are the same.
129*74.11.22 dsl If the -card or -convert option is given, the source pathname,
                 unique id, and date-time-modified stored in the object
                 segment will be incorrect.
128*74.11.22 dsl If an internal builtin function name is declared with a mode

which is not the same as the mode of that builtin function,
the name should not acquire the builtin attribute.

127*74.11.22 dsl If an internal builtin function name is declared with the
external attribute, it should not acquire the builtin
attribute.

126*74.11.22 dsl Incorrect code is generated for alternate return statements if
the expression is not integer.

125*74.11.20 dsl Character assignment statements whose right hand side is a
character function are not compiled correctly. The result
of the function should be placed in a temporary if the
character length of the function is not equal to the length
of the left hand side.

124*74.11.06 dsl The correct argument descriptor is not being generatec
for elements of parameter variable bound arrays.
If an element of a parameter variable bound array
appears in an external call or function reference,
the descriptor for the entire array is currently used.

123*74.11.06 rab The entry point code does not pick up a pointer to the
parameter descriptors. This will prevent access to these
descriptors. This only affects references to parameter
array descriptors and will only affect call statements
anc function references which reference the entire array.
(See also bug 124.)

122*74.11.04 dsl Certain subscript expressions involving constants result in a
fatal process error during compilation. The form affected
is constant - simple_reference.

121*74.10.23 rab Complex builtins and relational expressions with constant
arguments can fail to compile correctly if the real part
of any constant is an integer. This is identical tc
PL/I bug 1239.

120*74.10.23 dsl A fatal process error may occur instead of an error message fo
list-directed input errors.

118*74.10.04 dsl Alternate return labels are not implemented
correctly. Attempts to use alternate return
labels will generally result in a fault.

117*74.09.30 dsl Incorrect code is generated for subscripted
references when the -subscriptrange (-subrg)
options is specified. Code is correct if this
option is not used.

116*74.09.27 dsl Variables declared by parameter statements were
implemented incompletely. As a result these
variables could not appear in parameter
lists.

SUGGESTED IMPROVEMENTS

146*75.04.07 dsl Incluce the bit representation of the offending character in
the error message for error 75.

145*72.04.14 dsl Implied do loops in data statements are costly. Their usage
should be avoided where the feature is unnecessary. (e.g. -
dimension a(10,10);data ((a(i,j), i = 1, 10), j = 1, 10)
IS EXPENSIVE)

144 71.08.12 dsl The fcllowing improper sequence is not diagnosed:
do 10 i = 1, 10
...
if (...) go to 10
do 10 j = 1, 10
...

143 74.04.19 dsl Type conversion of constants is sometimes delayed until
execution, resulting is less efficient code. For example:

dc 100 x = 0, 13.
                    If x is a real variable, the constant 0 will be converted
                    to floating point (0.0) everytime the statement is
                    executed.
142 75.03.25 dsl Mode statements of the form:
                    mode*k
                    are emitted by the compiler when using the -convert option,
                    although they are not acceptable to the compiler without
                    this option.

PLANNED LANGUAGE FEATURES

FURTHER INFORMATION

When a problem is discovered, it is given a date and a serial number.
An attempt is made to produce a small test case which exhibits the problem.
Where it is helpful, the relevant parts of the test case will appear with
the description of the problem.

Some test cases are saved and used to check for compiler regression.

If it appears the compiler is "looping", QUIT, then type trace_stack.
Submit the trace_stack output and a description of your problem through
the standard bug reporting procecure of your installation.
(END)

```
*****   ***   ****   *****   ****     *      *    *        ****   *****
  *     *   *  *   *    *     *  *    * *     **   *       *          *
****    *   *  ****     *     ****   *   *    * *  *        ***      *
  *     *   *  *        *     *  *   *****    *  * *  **       *    *
*****   ****   *        *     *  *   *   *    *   *   **     ****   *
```

```
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$
$   Requested 04/10/75   1605.0 mst Thu
$   Output     04/10/75   1607.7 mst Thu
$   Print queue 3                                      prtd
$
$   146 lines, 5 pages
$
$   85 blocks at $ 0.50 per 1000 blocks
$
$   Total charge to RBarnes.Multics.m
$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
```

Multics Change Request

TITLE: Delete Version 1 Graphics Software	STATUS	DATE
AUTHOR: John Gintell	Written	04/08/75

	Category (Check One)	STATUS	DATE
-Coded in: ☐ PL/I ☐ ALM ☐ other- explain in DETAILED PROPOSAL	Lib. Maint. Tools	Status	A 04/15/75
-Planned for System MR _____	Sys. Anal. Tools	Expires	10/15/75
-Fixes Bug Number(s) _____	Sys. Prog. Tools	DOCUMENTATION CHANGES	
-Documented in MTB _____	355	Document	Specify One or More
-User/Operations-visible	BOS		
Interface change? ☒ yes ☐ no	Salvager	MPM (Vol, Sect.)	
-Incompatible change? ☒ yes ☐ no	Ring Zero		
-Performance: ☒ Better ☐ Same	Ring One	PLMS (AN #)	
☐ Worse	SysDaemon/Admin.	MOSN (Sect.)	
-Replaces MCR _____	Runtime	MPAM (Sect.)	
	X User Cmmd/Subr.	MSAM (Sect.)	

Objections/Comments:	Info Segs	
	Other (Name)	
	None (Reason)	

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Delete Version 1 Graphics software from the system.

REASONS:

Version 1 Graphics software is incompatible with
Version 2 which has recently been approved for
addition to the system.

It is badly implemented, unnecessarily complicating
the ring0 Typewriter DIM.

DETAILED PROPOSAL:

1. Remove graphics handling from ring0 Typewriter DIM
    (MCS).

2. Delete bound_graphics_.

3. Delete bound_lsm_.

4. Remove lsm and graphics error codes from error table.

IMPLICATIONS:

Users of Version 1 graphics have already been warned
that it will be replaced.

```
 _____
! Ver. 3                                      !                        !
! 741022            MULTICS CHANGE REQUEST    !   MCR____1119_____ !
!_____!_____!
! TITLE:   New date/time strings for          !_STATUS__!__DATE_____!
!          convert_date_to_binary_            ! Written !_04/01/75___ !
! AUTHOR: Gary C. Dixon                       ! Status  !A 04/15/75    !
!_____!_Expires_!_10/01/75___ !
! Planned for  System:   not applicable       !_____ !
! Fixes Bug Number(s):   not applicable       !_CATEGORY_(check_one)! !
! Documented in MTB:     155                   !( )Lib. Maint. Tools ! !
! Incompatible Change:   no                    !( )Sys. Anal. Tools  ! !
! User/Operations-visible Interface Change:  yes !( )Sys. Prog. Tools ! !
! Coded in: (B)PL/I ( )ALM ( )other-see below  !( )355               ! !
! Performance: ( )better ( )same (B)worse      !( )BOS               ! !
!_____!( )Salvager          ! !
! DOCUMENTATION_CHANGES_(specify_one_or_more)  !( )Ring Zero         ! !
! MPM (vol,sect) MPM Sub.   MPAM (sect)        !( )Ring One          ! !
! MOSN (sect)              MSAM (sect)         !( )SysDaemon/Admin   ! !
! PLMs (AN#)                                   !( )Runtime           ! !
! Info Segs                                    !(B)User Command/Subr ! !
! Other         MPM Subroutines is AG-93       !                     ! !
!_____!_____! !
! OBJECTIONS/COMMENTS:                         !                        !
!                                              !                        !
!                                              !                        !
!_____!
```

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:
    Make an upwards compatible extension to the date/time strings accepted
by convert_date_to_binary_ to simplify the format of the string and make it
more natural to use.

REASONS:
    People at the Design Review for MTB-155 concluded that it was
extremely awkward and unnatural to use the offset feature (eg, 1 month,
5 days, Saturday) in the current date/time string format, and that the
extensions proposed for offsets in MTB-155 would further complicate the
format and would lead to some ambiguities in the meaning of date/time
strings (eg, 03/01/75 -1 day +1 month). One of the suggestions resulting
from MTB-155 was extended to cover all cases, and is shown in the DETAILED
PROPOSAL below.

IMPLICATIONS:
    Users should find date/time strings containing offsets more natural to
use and less ambiguous in their meaning. Backward offsets can be added to
the date/time string in a more natural way.

DETAILED PROPOSAL:
1)   New Features 3 through 11 and all of the Changed Features were
     well-accepted by the Design Review, and would be incorporated in the
     change. These features were deemed beneficial, no matter what
     date/time format was used.

2) Date/time strings, as accepted today, would continue to be accepted, with the exception of the three items mentioned in Changed Features section of MTB-155. It was deemed that these changes would not affect users, but instead correct bugs in the current version of convert_date_to_binary_.

3) Install encode_clock_value_ and decode_clock_value_, as documented in MTB-155.

4) Change the documented specification for the date/time string to be as follows:

```
 _      _           _                _   _ _   _        _
|        |    |DATE               _ | |TIME| |TIME-ZONE |
|OFFSET|...  |        [CONSTRAINT]| |    | |          |
|      |    |today               | |now | |LOCAL-ZONE|
|_    _|    |_                  _| |_  _| |_        _|
```

The new date/time string would be processed from right to left, first interpreting the absolute date and time, then applying any offsets which are given in their order of appearance.

The DATE would be specified as it is today. New Feature 5 of MTB-155 would add a new date form:

YEAR_OF_CENTURY.MONTH.DAY

For example, 75.2.1 for February 1, 1975. In addition, because some date specification would be required when a CONSTRAINT or OFFSET was given, the new term "today" would be allowed, representing today's date which is the default if no DATE is given.

As indicated above, the CONSTRAINT can only appear if a DATE is given. The CONSTRAINT constrains that the specified date falls on the given day of the week. The format of a DATE-CONSTRAINT phrase would be:

DATE falls on DAY_NAME

where DAY_NAME is the name of a day of the week. If DATE did not fall on the specified DAY_NAME, an error would occur.

The TIME would be specified as it is today. New Feature 6 of MTB-155 would allow extra digits to be used in the fractional minutes field of time form:

HHMM.MMMMMMM

where HH is an hours specification, MM. is a minutes specification, and MMMMMMM is an optional fraction of minutes. If no TIME is given, the default time is the current time. A new term "now" would be allowed, so that this default could be explicitly specified when used with a time OFFSET.

The TIME-ZONE would be specified as it is today. Different time zones could be defined at individual installations by changing the values in the time_table_ data base, proposed as New Feature 10 in MTB-155. If no TIME-ZONE were specified, the local time zone (from sys_info) would be

used.

As mentioned above, a DATE and/or TIME would be required whenever an OFFSET
was used. The OFFSETS would have to precede the DATE and TIME, and would
be applied to the DATE/TIME in their order of appearance from right to
left. Two forms of offsets would be allowed: day name offsets; and time
period offsets. These forms are shown below.

```
DAY NAME OFFSET                              EXAMPLE
----------------                             -------
DAY_NAME before DATE/TIME                    Tuesday before 04/07/75
DAY_NAME on or before DATE/TIME              Monday on or before 04/07/75
DAY_NAME before or on DATE/TIME              Monday before or on 04/07/75
DAY_NAME after or on DATE/TIME               Monday after or on 04/07/75
DAY_NAME on or after DATE/TIME               Monday on or after 04/07/75
DAY_NAME after DATE/TIME                     Tuesday after today
```

where DAY_NAME is the name of any day of the week.


```
TIME PERIOD OFFSET                           EXAMPLE
------------------                           -------
NUMBER PERIOD before DATE/TIME               2 weeks before 04/07/75
NUMBER PERIOD after DATE/TIME                3 days after today
                                             10 minutes after now
```

where NUMBER is a non-negative integer, and PERIOD is one of the time
periods shown in the table below. If the NUMBER were 1, a singular PERIOD
would be required. Otherwise, a plural PERIOD would be required. PERIOD
abbrevations would be treated as both singular and plural.

```
PERIOD                        PERIOD Abbreviation
------                        -------------------
second(s)                     sec
minute(s)                     min
hour(s)                       hr
day(s)                        da
week(s)                       wk
month(s)                      mo
year(s)                       yr
```

EXAMPLES:

Make sure specified date falls on Tuesday:
    memo -time "4/8/75 falls on Tuesday" Meet on Tuesday

Invoke crank absentee job on last day of this month:
    ear crank -time [date_time 1 day before 1 month after [month]/1
midnight]

er. 3
41022

Multics Change Request

MCR   1120
Page   1 of 1

EDS

TITLE: Change get_quota
AUTHOR: Steve Herbst

STATUS	DATE
Written	04/03/75
Status	A 04/15/75
Expires	10/15/75

-Coded in: [X] PL/I [ ] ALM [ ] other-
explain in DETAILED PROPOSAL
-Planned for System MR _____
-Fixes Bug Number(s) _____
-Documented in MTB _____
-User/Operations-visible
 Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same
   [ ] Worse
-Replaces MCR _____

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	No change

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Change the get_quota command to call
hcs_$quota_read instead of the obsolete
entry hcs_$quota_get.

REASON:

The new entry returns a fixed bin(71) value
for the time-page product instead of a fixed
bin(35) value and the gq command was never
updated to handle the larger value.

Multics Change Request

MCR 1121

Page 1 of 1

JG

TITLE: Fix bug in initiate command

AUTHOR: S. Herbst

STATUS	DATE
Written	04/15/75
Status	A 04/15/75
Expires	10 15/75

-Coded in: ☒PL/I ☐AIM ☐other-
explain in DETAILED PROPOSAL
-Planned for System MR_____
-Fixes Bug Number(s)_____
-Documented in MTB_____
-User/Operations-visible
 Interface change? ☒yes ☐no
-Incompatible change? ☐yes ☒no
-Performance: ☐Better ☒Same
 ☐ Worse
-Replaces MCR_____

Category (Check One)	
Lib. Maint. Tools	
Sys. Anal. Tools	
Sys. Prog. Tools	
355	
BOS	
Salvager	
Ring Zero	
Ring One	
SysDaemon/Admin.	
Runtime	
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	

Objections/Comments:

Info Segs	
Other (Name)	
None (Reason)	NO CHANGE

Use these headings: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (Optional)

SUMMARY:

Fix bug in the initiate command whereby bad control
arguments are interpreted as reference names.

REASON:

Currently, any argument beginning with a minus sign
other than -s, -lg, and -long is made a reference
name on the segment being initiated.